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which he has already given an account in a former communication, gives tabulated results of his chemical examination of several varieties of gamboge, and formulæ expressing their chemical constitution. A detailed account is given of the properties of the gambodic acid, and of the salts it forms with various bases, such as the gambodiates of potash and soda, of ammonia, and of different earths and metals, particularly lime, strontia, magnesia, lead, copper, zinc, and silver. He concludes from this investigation that the most probable formula for gamboge is  $C_{40} H_{23} O_8$ . In the analysis, however, of every specimen, there occurred a deficiency of carbon, amounting to nearly one per cent.; a deficiency supposed to be due to a change produced during the preparation of the natural resin for the market. By a heat of  $400^{\circ}$  Fahr. gamboge undergoes a partial decomposition; a resin, soluble in alcohol, and another resin, insoluble in that menstruum being formed: the formula representing the latter being  $C_{40} H_{22} O_9$ . Gamboge forms with the metallic oxides numerous salts, the existence and constitution of which, however, the experiments of the author only render probable.

The inquiries of the author were next directed to the chemical constitution of the resin of guaiacum, and to the properties of the salts it forms with various bases. He then examines the *acaroid resin*, which exudes from the *Xanthorrhœa hastilis*, and is often known by the name of *Botany-bay resin*, or *yellow gum*; and finds its formula to be  $C_{40} H_{20} O_{12}$ , showing that it contains more oxygen than any other resinous substance hitherto analyzed.

The general conclusions drawn by the author from these researches are the following.

1. Many of the resins may be represented by formulæ exhibiting their elementary constitution, and the weight of their equivalents, in which 40 C is a constant quantity.

2. There appear to be groups, in which the equivalents, both of carbon and the hydrogen, are constant, the oxygen only varying; and others, in which the hydrogen alone varies, the two other elements being constant.

In the third part of the same series of investigations, the author examines the constitution of the resin of Sandarach of commerce, which he finds to consist of three different kinds of resin, all of which possess acid properties. In like manner he finds that the resin of the *Pinus abies*, or spruce fir, commonly called *Thus*, or ordinary *Frankincense*, consists of two acid resins; the one easily soluble in alcohol, the other sparingly soluble in that menstruum. The gum resin *olibanum*, of commerce, was found to consist of a mixture of at least two gum resins, the resinous ingredient of each of which differs from that of the other in composition and properties.

7. "On the Markings of the Eel-back Dun variety of the Horse, common in Scotland;" in a letter to P. M. Roget, M.D., Sec. R.S. By W. Macdonald, M.D., Fellow of the Royal College of Physicians of Edinburgh, F.R.S. Ed., F.L.S., &c. Communicated by Dr. Roget.

The author states some observations which he has made on the coloured marks apparent in a variety of the horse, common in Scotland, and there called the *Eel-back Dun*, and which afford grounds for doubting the accuracy of the conclusions deduced in a paper, by the late Earl of Morton, published in the Philosophical Transactions for 1820. The title of the paper referred to is "A Communication of a singular fact in Natural History," namely, that a young chestnut mare of seven-eighths Arabian blood, after producing a female hybrid by a male quagga, had subsequently produced, by a fine black Arabian horse, a filly and a colt, both of which had the character of the Arabian breed as decidedly as could be expected where fifteen-sixteenths of the blood are Arabian, but in colour, in the hair of their manes, and the markings of the back and legs, bore a striking resemblance to the quagga.

The author, finding that similar markings are very commonly met with on the Eel-back dun ponies of Scotland, suggests, that as the breed of the mare in question was not pure she may have inherited the tendency to those peculiar markings. He moreover observes, that the cross bar markings on the legs are not found in the *quagga*, but only in the *zebra*, which is a species quite distinct from the quagga; a fact which he considers as completely overturning the reasoning by which the conclusions stated in Lord Morton's paper were deduced. The facts, he thinks, admit of a more natural explanation, and one more consistent with the known physiological laws of developement, by supposing the stain in the purity of the mare's Arab blood to have arisen from the circumstance of an early progenitor of the mare having belonged to the Eel-backed dun variety, the peculiarities of which reappeared in a later generation.

8. "On the Structure and Functions of the Spleen." By Thomas Gordon Hake, M.D. Communicated by Francis Kiernan, Esq., F.R.S.

The author, passing in review the various opinions which have been advanced by anatomists respecting the intimate structure of the spleen, arrives at the conclusion that hitherto only vague and premature inductions have been made. It is generally admitted that the fibrous envelope of this organ is formed of the external fibres of the splenic vein; and that from the internal surface of this envelope fibrous prolongations are continued into the interior of its substance, giving support to a fine cellular membrane, which is continuous with their edges, and variously reflected so as to constitute cells. The parenchyma, or solid structure of the spleen, everywhere accompanies these membranous productions, and forms the exterior walls of the cells; being composed of branches of the splenic arteries, of the granular terminations of those arteries constituting the *splenic grains* of Malpighi, of *venules*, which ramify around the splenic grains, and of *cellules*, into which the venules open, and from which the splenic veins take their rise. The author concludes, as the result of his inquiries, that a dilatable cellular tissue exists, containing venous blood, between the granules within which the arteries ter-